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ABSTRACT

This study of metacognition and motivation explored variations over time in the relationships between children's metacognitions about their study activities and various components of motivation for achievement. The study attempted to: (1) identify possible causal relations between metacognitive and motivational variables by looking at their concurrent and predictive relations; and (2) verify the notion that children who report the use of cognitive strategies and self-regulation will exhibit mastery-oriented motivational goal patterns rather than ego-oriented or work-avoidant patterns. Self-report measures assessing study strategy use (rote memory strategy use, cognitive strategy use, and self-regulation), attributional beliefs, and goal orientations were administered to 154 fifth-, sixth-, and seventh-grade parochial school students in the fall and spring of the same academic year. Results confirmed a positive relationship between reported strategy use and task mastery orientation; children who reported strategy use in the fall tended to be task-mastery oriented in the spring; and children who were mastery oriented in the fall reported greater strategy use in the spring. (LL)

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Does metacognition about study activities predict motivational orientation in school-aged children

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ABSTRACT

The concurrent and predictive relations between children's metacognitions about their study activities and various components of motivation for school achievement were investigated. Self-report measures assessing study strategy use, attributional beliefs, and goal orientations were administered to fifth-, sixth-, and seventh-grade children in the fall and the spring of the same academic year. Results confirmed the positive relationship between reported strategy use and task mastery orientation. Cross-lagged canonical correlations revealed that children who report strategy use in the fall tended to be task-mastery oriented in the spring. Children who are mastery oriented in the fall reported greater strategy use in the spring.

INTRODUCTION

Several studies focusing on goal orientation have shown the relationships between cognitive strategy use, metacognition and motivation. For example, Nolen (1988) and Nolen and Haladyna (1990) showed that task orientation is strongly associated with students' strategy value beliefs and their use of study strategies. Ames and Archer (1988) discovered that perceived goal orientation in the classroom setting was sufficient to predict strategic and motivated learning. Pintrich and DeGroot (1990), employing a correlational design, found that higher levels of student motivation (self-efficacy and intrinsic value measures) were correlated with higher levels of cognitive strategy use and self-regulation.

Few studies in metacognition and motivation have explored variation over time in the relationships between children's metacognitions about their study activities and various components of motivation for achievement. The major purpose of this study was to identify the possible causal relations between metacognitive and motivational variables by looking at their concurrent and predictive relations. We wanted to verify the notion that children who report the use of cognitive strategies and self-regulation will exhibit mastery-oriented motivational goal patterns rather than ego-oriented or work-avoidant patterns. Additionally, we wanted to find out whether children who report more sophisticated metacognitions about their study activities will exhibit attributional patterns that are more internal than external. We hypothesized that children who report being strategic in their study will

become more mastery-oriented and will use more internal attributions over time.

METHOD

Subjects

Research participants were 154 children from parochial schools in a large Southern city. There were 70 boys and 84 girls who predominantly come from middle to lower-middle income families. The sample included 51 fifth-graders (mean age = 126 months, SD = 5.92), 51 sixth-graders (mean age = 138 months, SD = 7.18), and 52 seventh-graders (mean age = 151 months, SD = 7.35). 62% were African-Americans, 33% were Caucasian-Americans, 4% were Hispanics, and 1% were from other ethnic groups.

Procedure

An index of metacognition was obtained through a self-report questionnaire that featured three subscales (rote memory strategy use, cognitive strategy use, and self-regulation) adapted from various instruments (e.g., Meece, Blumenfeld & Hoyle, 1988; Nolen & Haladyna, 1990; Pintrich and DeGroot, 1990; Weinstein, Palmer & Schulte, 1987). Rote strategies included repetitive learning activities (write words over and over, remember the facts). Cognitive strategies involved meaning-based strategies (outline important ideas, how information relates to the real world). Self-regulatory activities included monitoring and testing strategies (self-testing, planning study activities). Children used a 5-point scale (1=never to 5=always) to indicate how often they used these strategies when they study to learn something or to get ready for a test.

Measures of goal orientation were adapted from Nicholls' work (1984, 1989) and a study conducted by Meece, Blumenfeld, and Hoyle (1988). A self-report questionnaire that included items reflecting mastery-orientation, ego-orientation, and work-avoidant attitudes were presented and children rated these items on 5-point scales (1=disagree completely to 5=agree completely). A "mastery-ego" scale that used a forced choice format to compare preferences for mastery and ego goals provided an additional assessment of goal orientation.

Children ranked the relative importance of two internal attributions (*ability, effort*), two external attributions (*task difficulty, luck*), and one ambiguous attribution (*"don't know"*) in explaining success or failure outcomes in order to assess attributional beliefs. Attribution rankings were made for three success and three failure situations, all dealing with academic tasks familiar to them. An internal attribution score was obtained by summing effort and ability rankings for all six items. An external attribution score was the sum of task difficulty and luck rankings across all six items.

The questionnaires were administered to children in their classrooms over a span of three days in October (fall semester), and then again in May (spring semester). The order of administration of the questionnaires were counterbalanced among and within each of the schools.

RESULTS

Correlations comparing fall and spring scores on reports of rote strategy use, cognitive strategy use, self-regulation, internal attributions, external attributions, mastery orientation, ego orientation, and work-avoidant orientation were computed to assess the temporal stability of the measures. Table 1 displays the mean scores and standard deviations of the individual measures for fall and spring administrations. Children report moderate to high rote strategy use and self-regulation and moderate cognitive strategy use. They are moderately mastery oriented and ego oriented and less work avoidant in their motivation for school learning. The children's use of internal and external attributions for success and failure leans slightly toward internality. Correlations for fall-spring administrations indicated moderate temporal stability of the measures (r's = .29 to .58, $p < .01$).

Canonical correlations were obtained to investigate the concurrent relations among metacognition, attributional beliefs, and goal orientation for each time of administration. Table 2 shows the intercorrelation matrix using canonical correlations for the three sets of variables at each time of administration.

Metacognition about study activities was significantly related to goal orientation in both fall ($R_C = .63$, $p < .01$) and spring ($R_C = .60$, $p < .01$). According to Bartlett's test, the first pair of canonical variates accounted for the significant relationship between these two sets of variables at the .01 level at each time of administration. Inspection of correlations between the variables of the first pair of

canonical variates for the fall data set showed that children who report use of rote strategies (.87), cognitive strategies (.64), and self-regulation (.87) also tended to be mastery oriented (.86). A similar linear combination of canonical variates was evident in the spring data set. Children who report use of the above study strategies (.92, .68, and .90 respectively) are likely to be mastery-oriented (.95).

Metacognition about study activities was not significantly related to attributional beliefs in the fall but became generally related in the spring (R_c = .31, p < .05). One pair of canonical variates is significant for these two sets of variables at the .05 level. Inspection of correlations between variables of this pair indicated that children who report rote strategy use (.52) and self-regulation (.79) are likely to attribute successful outcomes to internal (.95) rather than external causes (-.74).

Likewise, **attributional beliefs and goal orientation were not significantly related in the fall but became significantly correlated in the spring (R_c = .44, p < .01).** Bartlett's test revealed that the first pair of canonical variates is significant for these two sets of variables in the spring at the .01 level. This pair indicated that children who attribute success externally (.91) rather than internally (-.88) are less likely to be mastery-oriented (-.82) and more work-avoidant (.89) in their goals for learning.

Since the concurrent relations between metacognition and goal orientation were strong for both fall and spring, we then proceeded to investigate the possible causal links between these sets of metacognitive and motivational variables using a cross-lagged canonical correlation technique. Fall scores on one set of variables (e.g., metacognitions

about study activities) were used to predict the spring scores of the other set (e.g., goal orientations). Figure 1 shows that **metacognition in the fall was significantly related to goal orientation in the spring (R_c = 0.43, p<.001)**. The first pair of canonical variates accounted for the significant relations between these two sets of variables. Inspection of the correlations between variables of the first pair revealed that **children who report using rote strategies (.96) cognitive strategies (.83), and self-regulation (.48) in the fall were significantly more mastery goal oriented (.89) in the spring**. As predicted by the literature, **goal orientation in the fall was significantly related to metacognition in the spring (R_c = 0.40, p<.001)**. The first pair of canonical variates indicated that **children who are mastery oriented in the fall (.92) are likely to report use of rote strategies (.96), cognitive strategies (.77), and self-regulation (.79) in the spring.**

CONCLUSION

In summary, our results first confirmed that metacognitions about study activities and motivational goals for school learning are bidirectionally related. Metacognition about study activities has both concurrent and predictive relations with mastery orientation. This is exciting to us because it suggests that one way to enhance mastery orientation for school learning in children is through strategy instruction and use. Secondly, our data suggested that the relations among reported strategy use, attributional beliefs, and goal orientation in school-aged children are still developing. Initial analyses indicate that internal attributional beliefs for successful outcomes may be formed from sustained strategy use and mastery goals for learning. We hope to investigate further these findings in our longitudinal study.

Table 1

Means, Standard Deviations, and Fall-Spring Correlations for Measures of Metacognition and Motivation

Measures	Fall n	Fall M	Fall SD	Spring n	Spring M	Spring SD	r's
Metacognitions about study activities	154			144			
Rote strategy use (max = 35)		24.0	5.2		22.6	4.7	.48**
Cognitive strategy use (max = 30)		19.3	4.9		18.8	4.9	.50**
Self-regulation (max = 35)		27.4	4.7		26.1	4.3	.38**
Goal orientations	154			144			
Mastery (max = 40)		33.2	5.8		30.9	6.5	.58**
Ego (max = 40)		30.6	6.9		30.7	6.4	.47**
Work avoidance (max = 50)		30.9	8.5		32.5	8.7	.54**
Mastery-ego scale (max = 100)		73.1	13.4	140	71.3	13.8	.54**
Attributional beliefs	154			144			
Internal-failure (max = 30)		19.1	4.5		20.0	4.2	.45**
Internal-success (max = 30)		22.7	3.7		22.4	3.9	.38**
External-failure (max = 30)		18.7	3.6		18.2	3.5	.29**
External-success (max = 30)		17.5	3.1		17.3	3.1	.31**

* $p<.05$
** $p<.01$

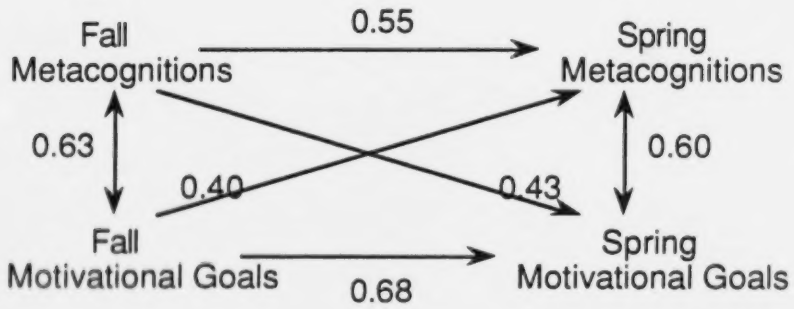
Table 2

Canonical Correlations Among the Sets of Variables for Fall and Spring

Sets	1	2	3
	Fall		
1. Metacognitions	1.00		
2. Goal Orientation	0.63**	1.00	
3. Attributional Beliefs	0.29	0.27	1.00
	Spring		
1. Metacognitions	1.00		
2. Goal Orientation	0.60**	1.00	
3. Attributional Beliefs	0.31*	0.44**	1.00

* $p<.05$
** $p<.01$

Figure 1. Cross-lagged panel canonical correlations between metacognitions about study activities and goal orientation



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